



AF 2814
#41
Ref. for
Rehearing
(1-22-04)
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:
Chen, et al.

Serial No.: 08/856,116

Confirmation No.: 2582

Filed: May 14, 1997

For: Reliability Barrier Integration
for Cu Application

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

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Group Art Unit: 2814 ✓

Examiner: G. Peralta

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REQUEST FOR REHEARING UNDER 37 C.F.R. 1.197(b)

Applicant submits this Request for Rehearing under 37 C.F.R. 1.197(b) to the Board of Patent Appeals and Interferences for reconsideration of the rejection of Claims 15-18, 21, and 23 affirmed in the Decision on Appeal mailed August 29, 2003. Three copies of this request are submitted for use by the Board.

GROUND FOR REHEARING

The Board errs in affirming the rejection of claims 15-18, 21, and 23 since the Decision by the Board is based on a combination of elements from different references that is not suggested or motivated by the references. The references cited by the Examiner alone or in combination do not teach, suggest, or motivate the subject matter claimed by Applicants.

The Board errs in asserting that it would have been obvious for one of ordinary skill in the art to deposit the PVD aluminum layer 24 of *Taguchi* in a selective manner, or to substitute selective electroless copper deposition for the overall PVD aluminum

deposition of *Taguchi*. *Zhao* describes selective electroless copper deposition on an exposed underlayer 13 of TiN at the bottom of a feature that has sidewalls covered with a barrier layer 17 of SiN or SiON. *Taguchi* shows a blanket deposition of sputtered aluminum on a conformal Ti or TiN barrier layer 23. Applicants submit that the combination of *Taguchi* and *Zhao* does not suggest the combination of the selective electroless deposition of copper from *Zhao* with the process of either *Zhao* or *Taguchi*, as the combined elements would require substantially altering the process and resulting substrate of *Taguchi*.

There is no teaching or suggestion in the combined references of a method of selective deposition on a conformal barrier layer, such as the conformal barrier layer 23 of *Taguchi*. Selectively depositing a metal layer on an underlayer exposed in a feature in *Taguchi* as described in *Zhao* would require eliminating the conformal barrier layer 23 of *Taguchi* so that the feature would have different materials on the sidewall and exposed underlayer of the feature that would provide a basis for selective deposition on the exposed underlayer of the feature. Replacing the conformal TiN layer 23 of *Taguchi* with the underlayer 13 of *Zhao* would remove the TiN layer 23 from the regions of the substrate besides the underlayer. *Taguchi* teaches that the layer 23 provides a barrier metal for the overlying metal layer. There is no suggestion in *Taguchi* that the TiN layer 23 is an optional layer or can be omitted from parts of the substrate.

Thus, Applicants submit that there is no suggestion or motivation in *Taguchi* and *Zhao* to deposit a first barrier layer over a blanket dielectric layer, form a feature through the first barrier layer and the dielectric layer to expose an underlayer, deposit a second barrier layer on a bottom and sidewalls in the feature, remove the second barrier layer formed at the bottom of the feature, and selectively deposit a metal layer on the underlayer exposed in the feature, as recited in claim 15.

In view of the above, the affirmation of rejection of claims 15-18, 21, and 23 is based on a combination of elements that is not taught or suggested by the references, and the rejections should be reconsidered or reversed.

Respectfully submitted,


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